WHAT IS CLAIMED

1. A variable valve actuation mechanism for use with an engine, said engine including a rotary camshaft having a central axis and at least one input cam lobe, said mechanism comprising:

a control shaft assembly including at least one shaft segment having a shaft axis and at least one pivot segment having a pivot axis, said shaft axis being substantially parallel relative to and spaced apart from said pivot axis, each of said pivot and said shaft axes being substantially parallel relative to and spaced apart from the central axis of the camshaft, said control shaft assembly being pivotable relative to said pivot axis;

an integrated body pivotally disposed on said at least one shaft segment, said integrated body including an input cam follower and at least one output cam surface, said input cam follower configured for engaging the input cam lobe, said at least one output cam surface configured for engaging a corresponding output cam follower of the engine; and

a spring engaging said integrated body and configured for biasing said input cam follower into engagement with the input cam lobe.

2. The variable valve actuation mechanism of claim 1, wherein each said at least one output cam surface comprises a base circle portion and a lift portion.

3. The variable valve actuation mechanism of claim 1, wherein each said at least one output cam surface is integral and monolithic with said integrated body.

4. The variable valve actuation mechanism of claim 1, wherein said integrated body defines an orifice therethrough, at least a portion of said shaft segment being received within said orifice.

5. The variable valve actuation mechanism of claim 4, further comprising a bearing insert disposed within said orifice, said portion of said shaft segment being received within said bearing insert.

6. The variable valve actuation mechanism of claim 1, wherein said input cam follower comprises a roller pivotally coupled to said integrated body.

7. The variable valve actuation mechanism of claim 1, wherein said spring comprises a torsion spring having first and second coils, first and second arm portions extending from said first and second coils, respectively, said first and second coils disposed on respective and opposite sides of said integrated body, said shaft segment extending through said first and second coils.

8. The variable valve actuation mechanism of claim 1, wherein said control shaft assembly further includes spring-tab-receiving features, said arms further comprising respective tabs, each of said tabs being received at least partially within said spring-tab-receiving features.

9. The variable valve actuation mechanism of claim 8, wherein said spring-tab-receiving features comprise one of grooves and orifices.

10. The variable valve actuation mechanism of claim 8, wherein said integrated body defines a central recess, said spring arms conjunctively defining a central tab, said central tab engaging said central recess.

11. An engine having a rotary camshaft with a central axis and at least one input cam lobe, said engine comprising:

a variable valve actuation mechanism including a control shaft assembly having at least one shaft segment with a shaft axis and at least one pivot segment with a pivot axis, said shaft axis being substantially parallel relative to and spaced apart from said pivot axis, each of said pivot and said shaft axes being substantially parallel relative to and spaced apart from the central axis of the camshaft, said control shaft assembly being pivotable relative to said pivot axis, an integrated body pivotally disposed on said

at least one shaft segment, said integrated body including an input cam follower and at least one output cam surface, said input cam follower engaging the input cam lobe, said at least one output cam surface engaging a corresponding output cam follower of the engine, and a spring engaging said integrated body and biasing said input cam follower into engagement with the input cam lobe.

12. The variable valve actuation mechanism of claim 11, wherein each said at least one output cam surface comprises a base circle portion and a lift portion.

13. The variable valve actuation mechanism of claim 11, wherein each said at least one output cam surface is integral and monolithic with said integrated body.

14. The variable valve actuation mechanism of claim 11, wherein said integrated body defines an orifice therethrough, at least a portion of said shaft segment being received within said orifice.

15. The variable valve actuation mechanism of claim 14, further comprising a bearing insert disposed within said orifice, said portion of said shaft segment being received within said bearing insert.

16. The variable valve actuation mechanism of claim 11, wherein said input cam follower comprises a roller pivotally coupled to said integrated body.

17. The variable valve actuation mechanism of claim 11, wherein said spring comprises a torsion spring having first and second coils, first and second arm portions extending from said first and second coils, respectively, said first and second coils disposed on respective and opposite sides of said integrated body, said shaft segment extending through said first and second coils.

18. The variable valve actuation mechanism of claim 11, wherein said control shaft assembly further includes spring-tab-receiving features, said arms further comprising respective tabs, each of said tabs being received at least partially within said spring-tab-receiving features.

19. The variable valve actuation mechanism of claim 18, wherein said spring-tab-receiving features comprise one of grooves and orifices.

20. The variable valve actuation mechanism of claim 18, wherein said integrated body defines a central recess, said spring arms conjunctively defining a central tab, said central tab engaging said central recess.

21. A variable valve actuation mechanism, comprising:

a control shaft assembly pivotable relative to a pivot axis;

a body pivotally disposed on said at least one control shaft assembly, said body including an input cam follower and at least one output cam surface, said input cam follower configured for engaging an input cam lobe, said at least one output cam surface configured for engaging a corresponding output cam follower; and

a spring engaging said body for biasing said input cam follower into engagement with the input cam lobe.